h	Venus' Helioc. Longitude. ° ′ ″	Venus' Helioc. Latitude. ° ′ ″	Venus' Log. Rad. Vect.
12	239 0 56·6	+0 9 55·5	9·8614762
13	239 4 54·3	+0 9 41·0	9·8614777

h	Venus' Apparent R.A. ° ′ ″	Venus' Apparent Decl. ° ′ ″	
12	317 36 26	−16 18 37	Log. distance 9·94883
13	317 39 14	−16 17 59	

h	Moon's R.A. ° ′ ″	Moon's Decl. ° ′ ″	′ ″
12	317 4 23	−15 45 55	Hor. Parallax 59 58
13	317 41 17	−15 38 21	Semi-diameter 16 20

Taking the position of Nanking from the *Connaissance des Temps*, a visible occultation again results:—

	h m	
Immersion, March 19 at	19 34	Apparent time at Nanking.
Emersion, ,, ,,	20 59	

Consequently the phenomenon occurred within "l'heure *tchin*," as recorded by the Chinese, and the Moon was at the time in the constellation named.

Note by the Astronomer Royal on the Numerical Lunar Theory.

In the *Monthly Notices of the Royal Astronomical Society* for 1874, January, vol. xxxiv., No. 3, I gave as the three equations of motion in the Lunar Theory the three following: (1) The equation of areas described by the radius vector parallel to the plane of the ecliptic; (2) The equation of *vis viva* parallel to the plane of the ecliptic; (3) The equation of motion perpendicular to the plane of the ecliptic.

It now appears preferable to substitute for (2) the equation of radial forces parallel to the plane of the ecliptic, which may be called (2*), and which is easily found to be the following:—

$$\frac{1}{2}\cdot\frac{d^2}{dt^2}\left\{\left(\frac{a'}{a}\cdot\frac{r'}{a'}\cos \mathrm{l}'\right)^2\right\}-\left(\frac{d}{dt}\left(\frac{a'}{a}\cdot\frac{r'}{a'}\cos \mathrm{l}'\right)\right)^2-\left(\frac{a'}{a}\cdot\frac{r'}{a'}\cos \mathrm{l}'\right)^2\cdot\left(\frac{dv'}{dt}\right)^2$$
$$+\left(\frac{a'}{a}\right)^2\cdot\frac{\epsilon'+\mu'}{a'^3}\cdot\frac{a'}{r'}\cos^2 \mathrm{l}'$$
$$=+\frac{\mathrm{P}}{a}\cdot\frac{a'}{a}\cdot\frac{r'}{a'}\cdot\cos \mathrm{l}'.$$

and the right-hand side of equation (2*) appears to consist of the following terms:—

$$+\left(\mathrm{e}-\frac{eq.\,c.\,f.}{2\,grav.}\right)\cdot\left(\frac{c}{a}\right)^2\cdot\left(\frac{a}{a'}\right)^3\cdot\left(\frac{a'}{r'}\right)^3$$

$$\times\left\{\begin{array}{l} 5\,(\sin\omega\,.\cos^2 l'\,.\sin v'+\cos\omega\,.\sin l'\,.\cos l')^2 \\ -2\,(\sin\omega\,.\cos^2 l'\,.\sin v'+\cos\omega\,.\sin l'\,.\cos l')\sin\omega\,.\sin v' \\ -\cos^2 l' \end{array}\right\}$$

$$+\frac{\sigma'}{A'^3}\cdot\left(\frac{A'}{R'}\right)^3\cdot\left(\frac{a'}{a}\right)^2\cdot\left(\frac{r'}{a'}\right)^2\times\left\{3\cos^2 l'\,.\cos^2\overline{v'-V'}-\cos^2 l'\right\}$$

$$+\frac{\sigma'}{A'^3}\cdot\frac{\epsilon-\mu}{\epsilon+\mu}\cdot\frac{a}{A'}\cdot\left(\frac{A'}{R'}\right)^4\cdot\left(\frac{a'}{a}\right)^3\cdot\left(\frac{r'}{a'}\right)^3$$

$$\times\left\{-15\cos^3 l'\,.\cos^3\overline{v-V}+\frac{3}{2}\cos l'\,.\cos\overline{v'-V'}+3\cos^3 l'\,.\cos\overline{v'-V'}\right\}$$

$$+\frac{\sigma'}{A'^3}\cdot\frac{\epsilon^3+\mu^3}{(\epsilon+\mu)^3}\cdot\left(\frac{a}{A'}\right)^2\cdot\left(\frac{A'}{R'}\right)^5\cdot\left(\frac{a'}{a}\right)^4\cdot\left(\frac{r'}{a'}\right)^4$$

$$\times\left\{+\frac{35}{2}\cos^4 l'\,.\cos^4\overline{v'-V'}-\frac{15}{2}\cos^2 l'\,.\cos^2\overline{v'-V'}-\frac{15}{2}\cos^4 l'\,.\cos^2\overline{v'-V'}+\frac{3}{2}\cos^2 l'\right\}$$

$$+\frac{\sigma'}{A'^3}\cdot\left(\frac{A'}{R'}\right)^3\cdot\left(\frac{r'}{a'}\right)^2\cdot\cos l'\,.\sin l'\times bt\times 3\,.\cos\overline{v'-V'}\,.\sin\overline{V'-K}$$

$$+\frac{\sigma'}{A'^3}\cdot\frac{\epsilon-\mu}{\epsilon+\mu}\cdot\frac{a'}{A'}\cdot\left(\frac{A'}{R'}\right)^4\cdot\left(\frac{r'}{a'}\right)^3.\cos^2 l'\,.\sin l'\times bt$$

$$\times\left\{-15\,.\cos^2\overline{v'-V'}\,.\sin\overline{V'-K}+3\sin\overline{V'-K}\right\};$$

and there are no terms multiplied by $\dfrac{dv}{dt}$.

1877, *March* 5.

The Astronomer Royal, in an oral address, adverted to M. Le Verrier's investigations on the possibility of discovery of an intra-mercurial planet, and to his issue of a circular requesting that observations of the Sun's disk for the passage of such planet might be made on March 21, more particularly on March 22, and on March 23. He pointed out that for observation of a transit whose time could not be even approximately predicted, but which certainly would occupy only two or three